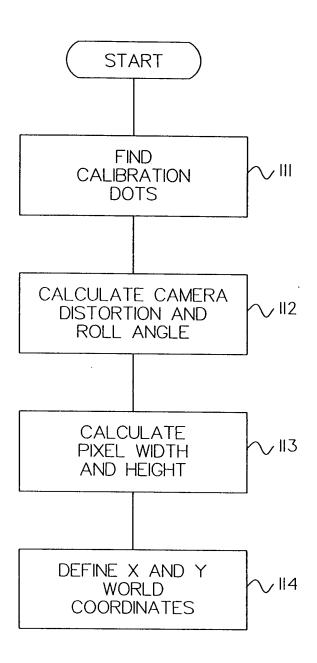




START  $\sqrt{|0|}$ PROVIDING A TRANSPARENT RETICLE HAVING A BOTTOM SURFACE WITH A PATTERN OF PRECISION DOTS. PROVIDING A CAMERA DISPOSED BENEATH THE √ 102 TRANSPARENT RETICLE TO RECEIVE AN IMAGE OF THE DOT PATTERN WHEREIN THE CAMERA PROVIDES THE IMAGE DATA. 1/103 PROVIDING A FRAME GRABBER BOARD TO RECEIVE THE IMAGE DATA.  $\sqrt{104}$ PROCESSING THE IMAGE DATA WITH A PROCESSOR TO CALCULATE THE STATE VALUES OF THE BOTTOM VIEW.

Fig\_2A





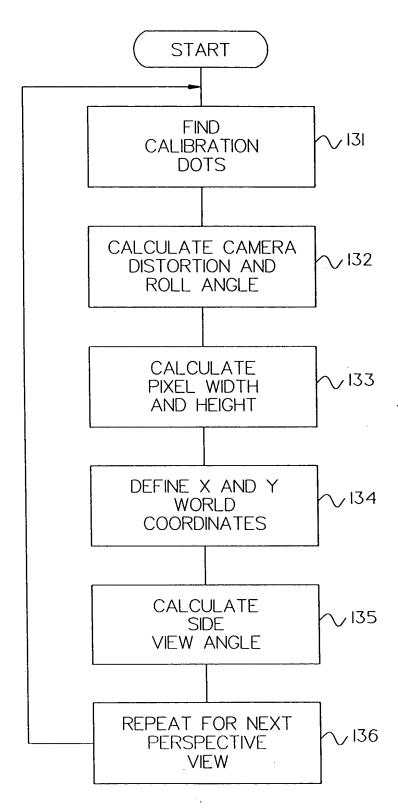
Fig\_ 2B



START PROVIDING A TRANSPARENT RETICLE HAVING A BOTTOM SURFACE WITH A PATTERN OF PRECISION DOTS. √ I22 PROVIDING FIXED OPTICAL ELEMENTS FOR OBTAINING SIDE PERSPECTIVE VIEWS. PROVIDING A CAMERA DISPOSED TO RECEIVE AN IMAGE 1/123OF SIDE PERSPECTIVE VIEWS REFLECTED FROM OPTICAL ELEMENTS. PROVIDING A FRAME GRABBER BOARD TO RECEIVE THE IMAGE DATA. PROCESSING THE IMAGE DATA WITH A PROCESSOR TO ∖∠125 CALCULATE THE STATE VALUES OF THE SIDE PERSPECTIVE VIEWS.

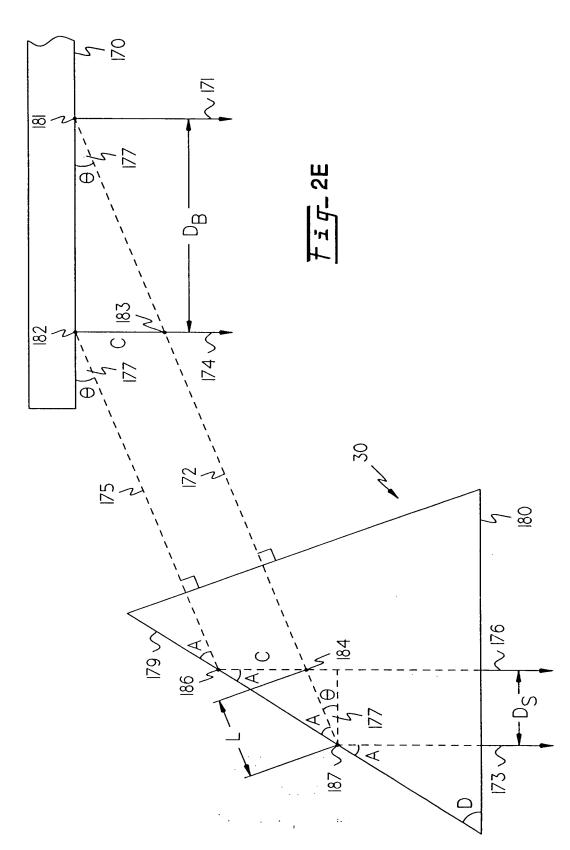
Fig\_ 20



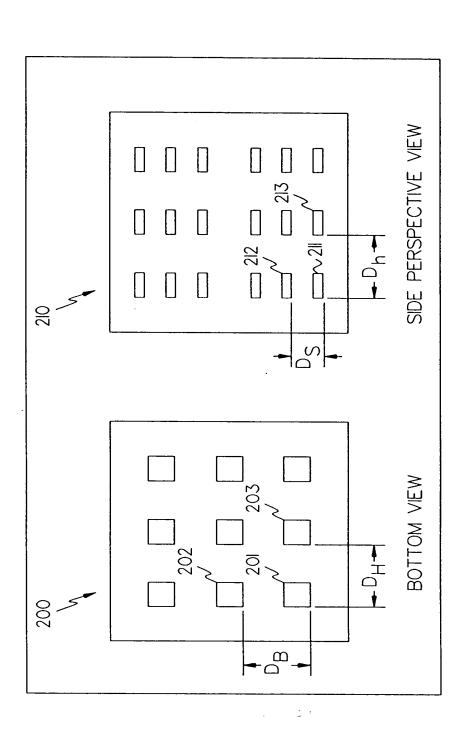


<u>Fig</u>\_2D



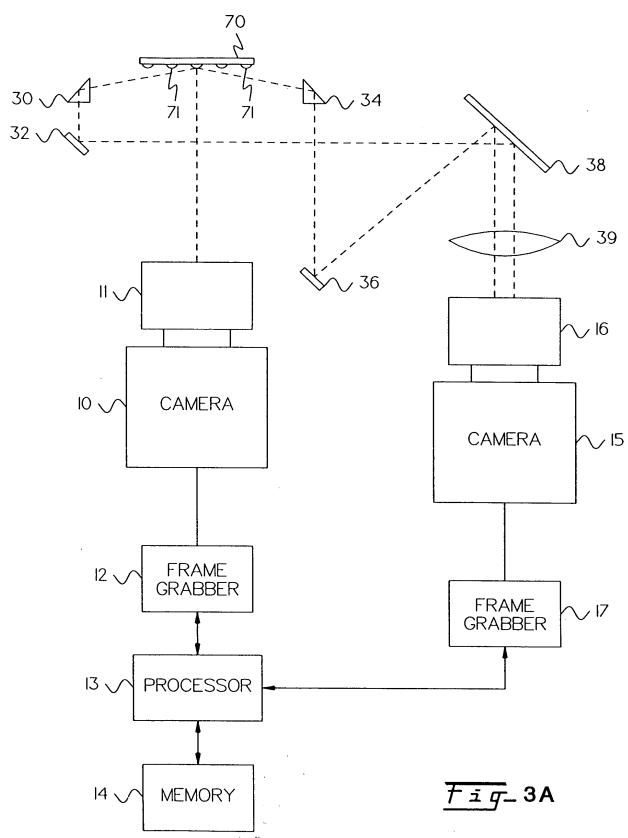




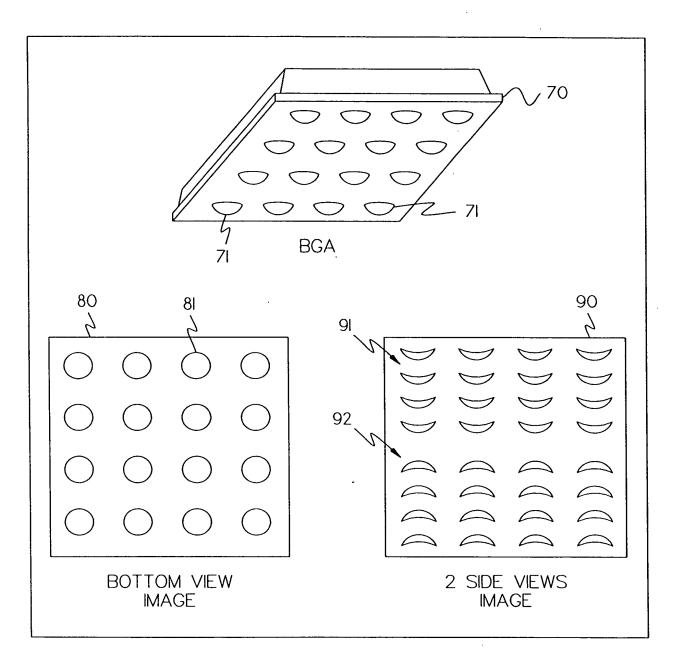


F = q-2F









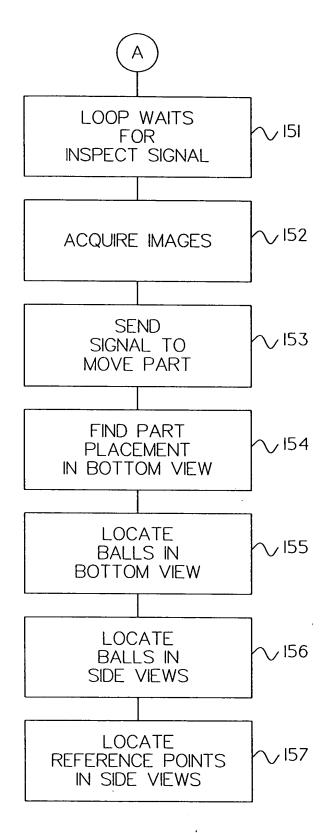
*f i g*\_ 3B



START //141 PROVIDING A PART HAVING BALLS FACING DOWN FOR INSPECTION. PROVIDING A CAMERA DISPOSED BENEATH THE CENTRAL 142 AREA OF THE PART TO BE INSPECTED.  $\sqrt{143}$ PROVIDING A FRAME GRABBER BOARD TO RECEIVE THE BOTTOM VIEW IMAGE DATA. V 144 PROVIDING FIXED OPTICS FOR PROVIDING TWO SIDE PERSPECTIVE VIEWS OF THE PART. 145 PROVIDING A CAMERA TO RECEIVE THE TWO SIDE PERSPECTIVE VIEWS OF THE PART. 1/146 PROVIDING A FRAME GRABBER BOARD TO RECEIVE THE SIDE PERSPECTIVE IMAGE. √147 PROCESSING THE IMAGE DATA TO PROVIDE A THREE DIMENSIONAL ANALYSIS OF THE PART.

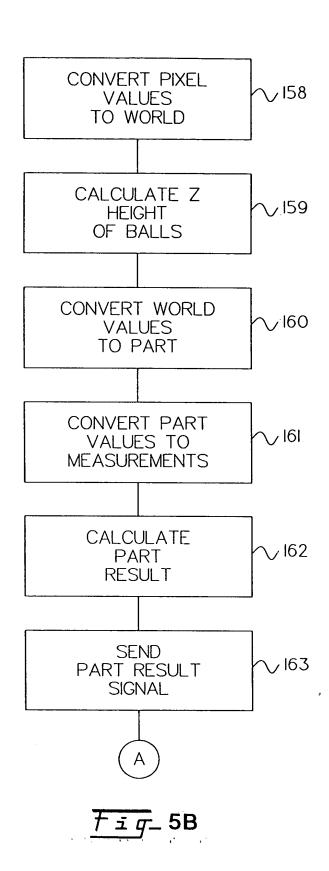
Fig-4



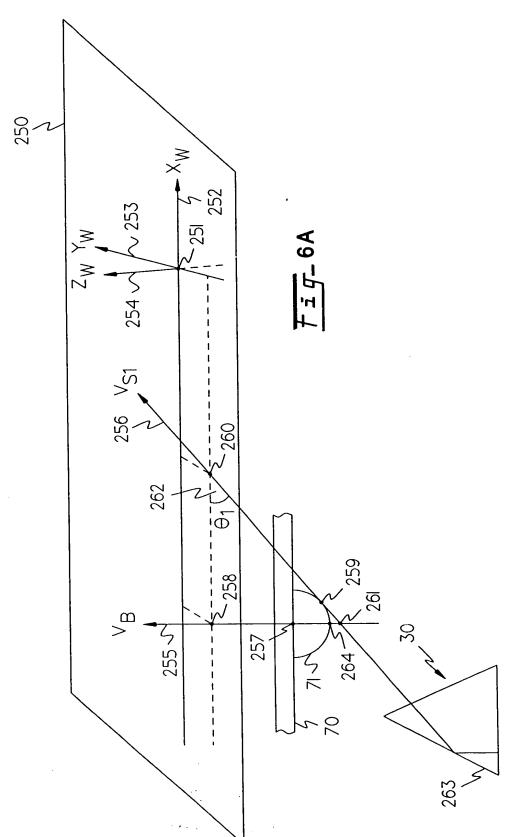


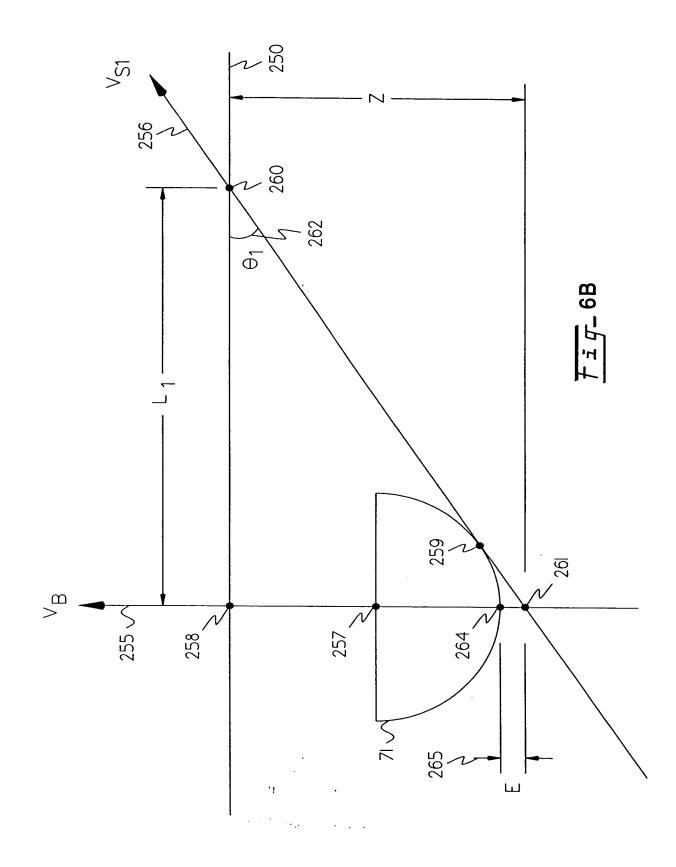
<u>Fig</u>\_5A



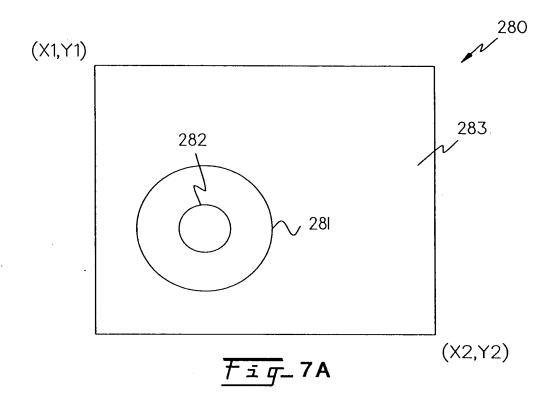


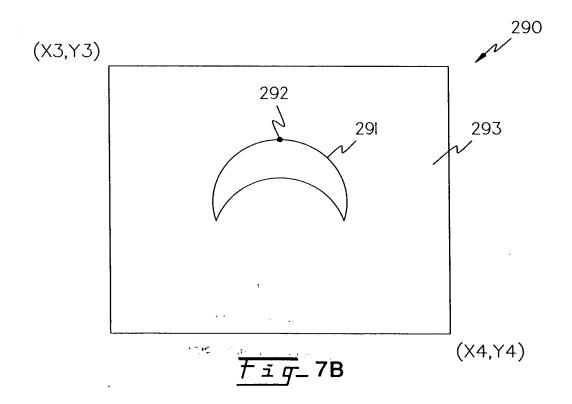




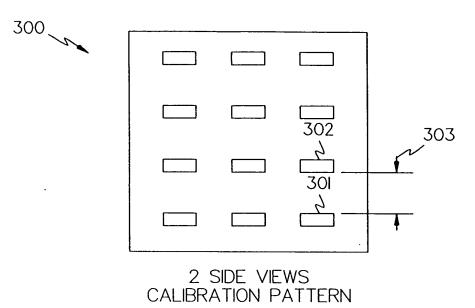




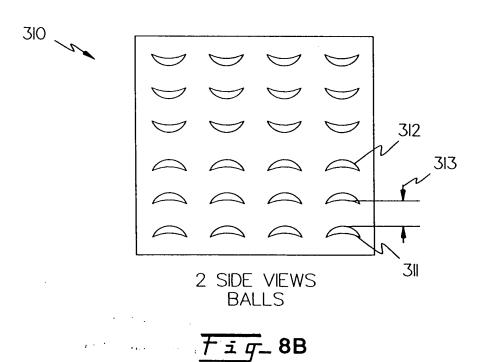




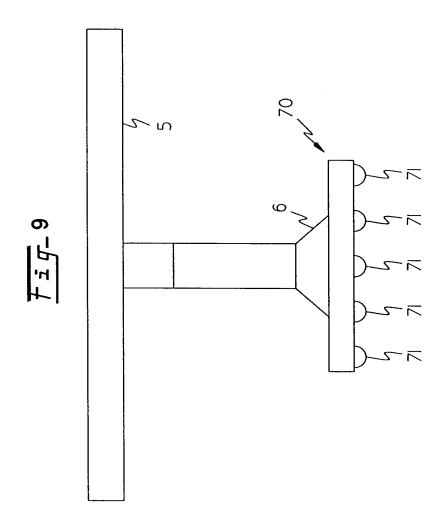


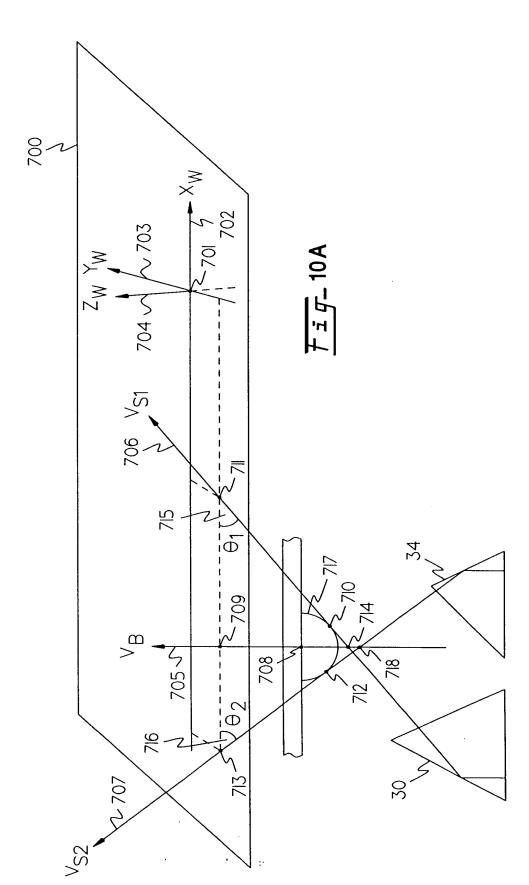


Fig\_8A

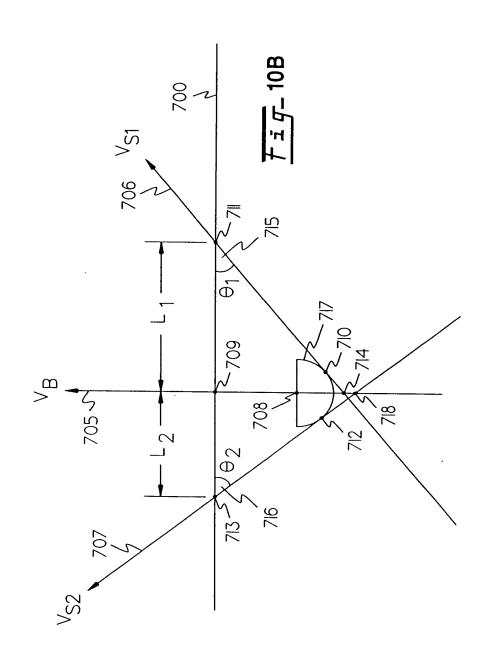




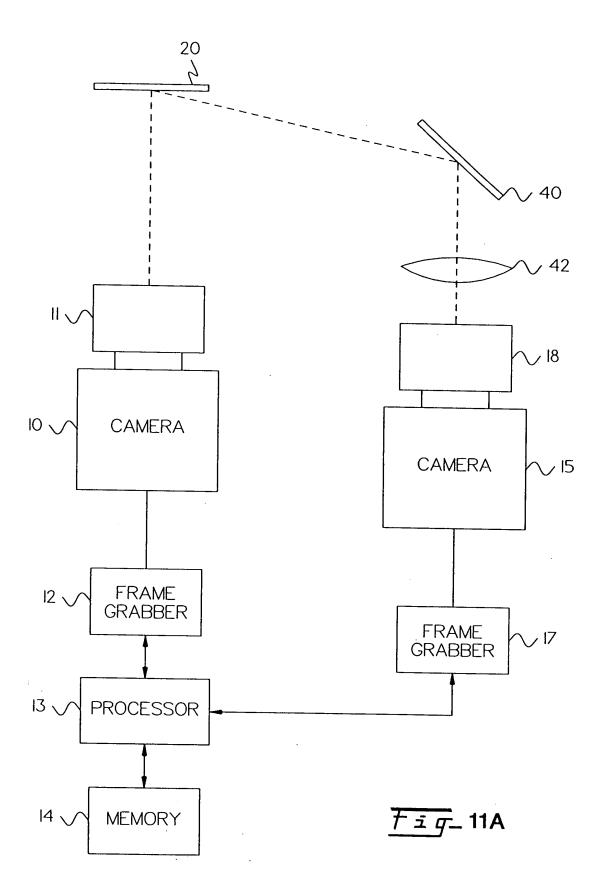










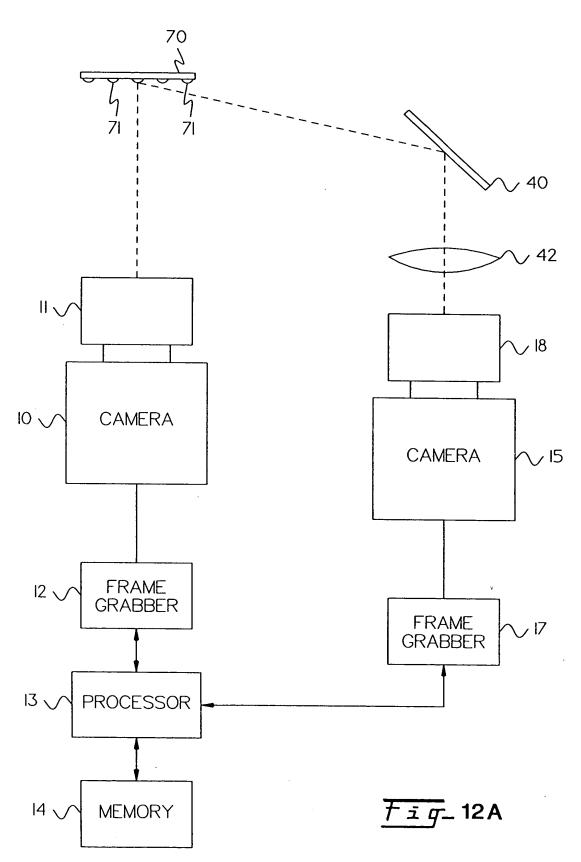




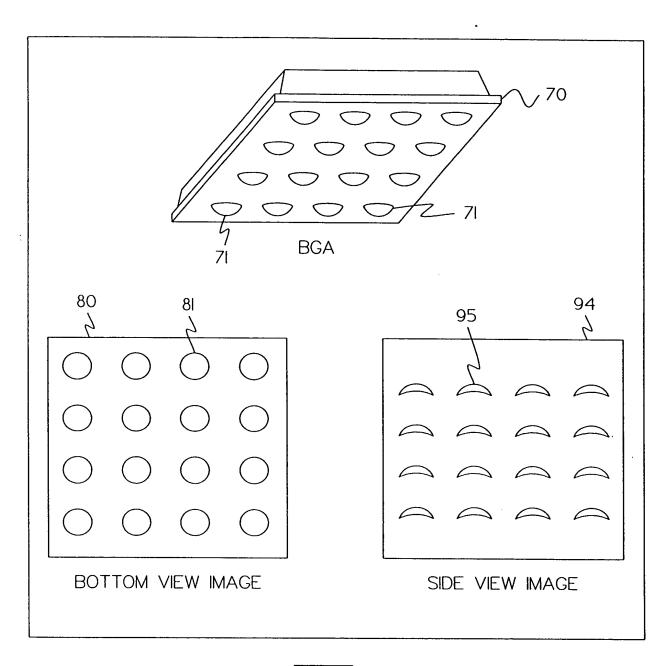
20 / / / / 22 // / / / 22 CALIBRATION RETICLE	
50	65
BOTTOM VIEW IMAGE	SIDE VIEW IMAGE

<u>Fig</u>\_11B



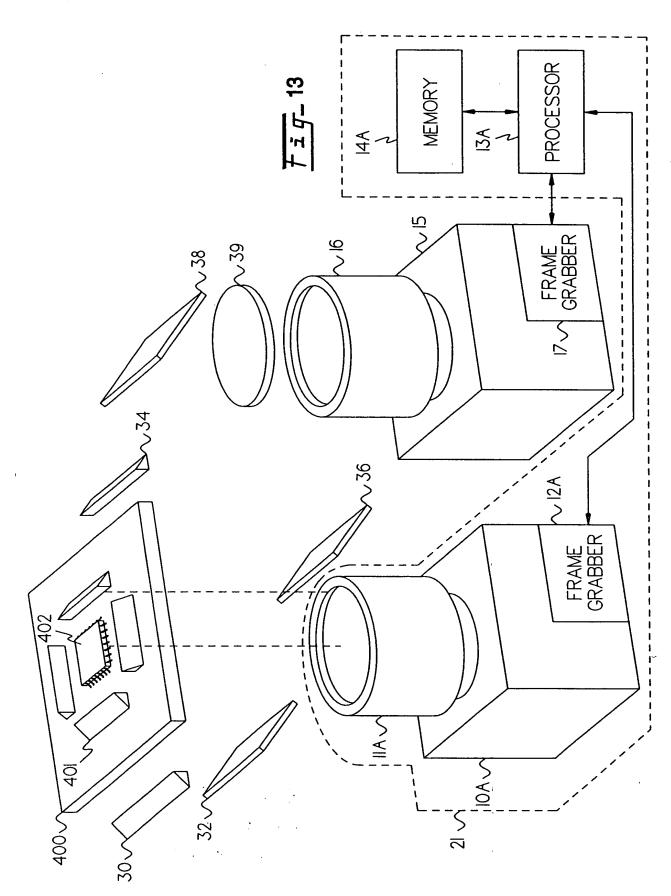




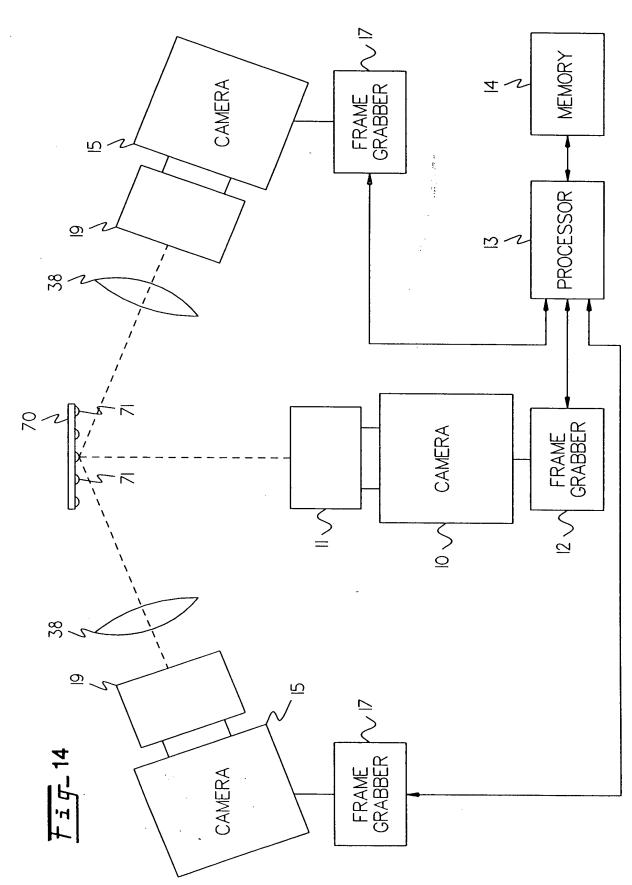


*Fig\_* 12B











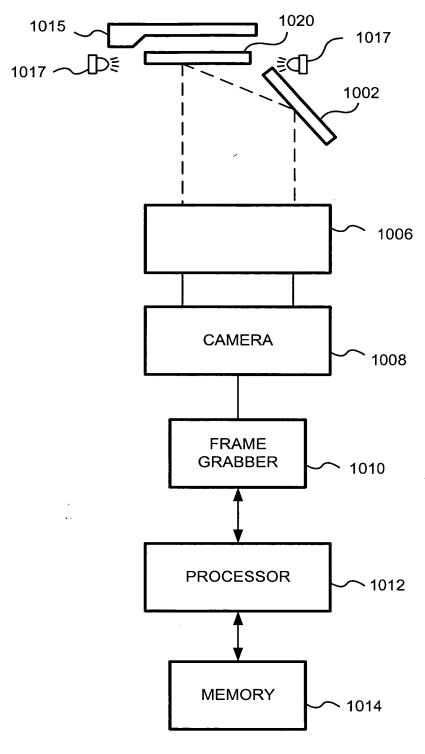
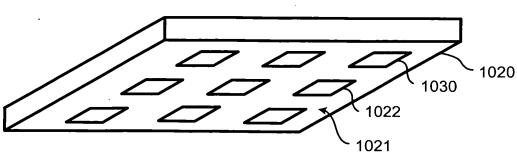


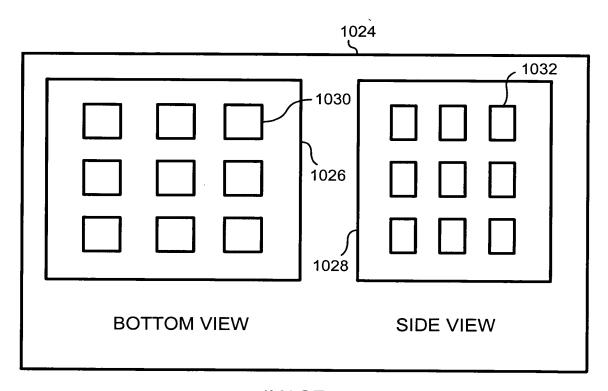
FIG. 15





**CALIBRATION RETICLE** 

FIG. 16A



**IMAGE** 

FIG. 16B



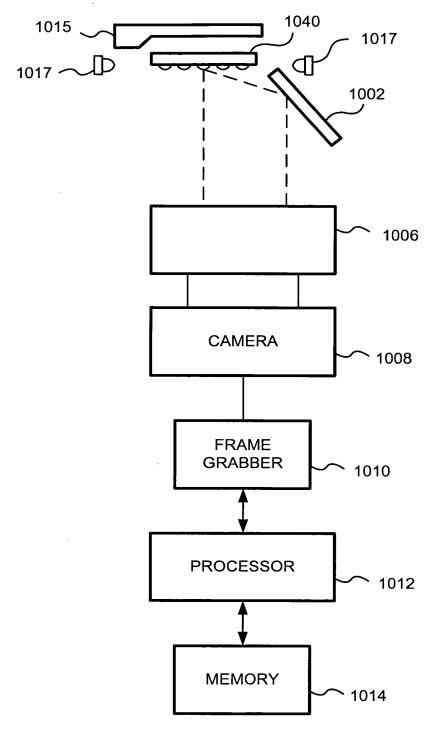


FIG. 17

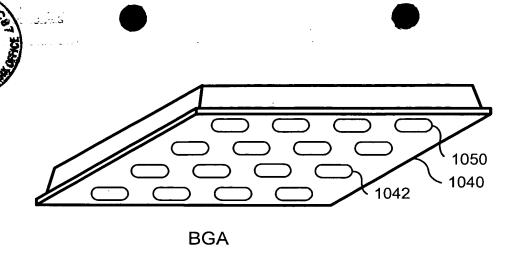
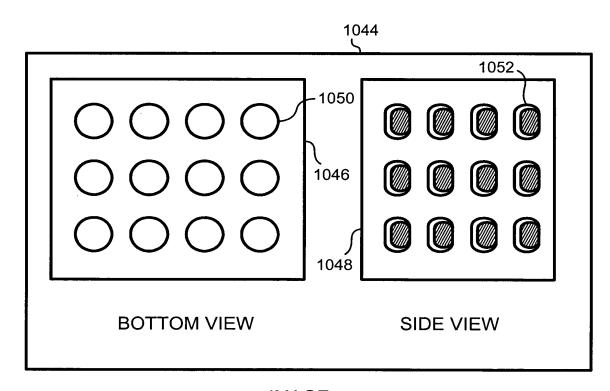


FIG. 18A



**IMAGE** 

FIG. 18B